WHAT IS CLAIMED IS:

1. A disk apparatus for reproducing a disk on which information is recorded by pits or marks with various lengths, comprising:

a photodetection unit configured to divisionally detect light reflected by the disk as a plurality of photodetection signals; and

a tracking error signal generation unit configured to generate a tracking error signal on the basis of a phase difference between the plurality of photodetection signals detected by the photodetection unit,

wherein the tracking error signal generation unit includes:

an equalization unit configured to equalize waveforms of the plurality of photodetection signals detected by the photodetection unit, and

the equalization unit has frequency-gain characteristics that obtain a gain of not less than 15 dB at a frequency corresponding to a shortest pit or mark.

2. An apparatus according to claim 1, wherein the equalization unit has frequency-gain characteristics that obtain a gain of not more than -3 dB at a frequency three times the frequency corresponding to the shortest pit or mark.

3. An apparatus according to claim 1, wherein the equalization unit includes:

a high-pass filter having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency, and a gain increases in a third frequency band between the first and second frequencies, and

a low-pass filter having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency.

4. An apparatus according to claim 2, wherein the equalization unit includes:

a high-pass filter having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency, and a gain increases in a third frequency band between the first and second frequencies, and

a low-pass filter having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency.

5. An apparatus according to claim 4, wherein the first frequency range is a frequency range 0.5 to 1.5 times a frequency corresponding to a pit or mark

with which a reproduction signal amplitude saturates,

the second frequency range is a frequency range 0.5 to 1.5 times the frequency corresponding to the shortest pit or mark,

the third frequency matches the frequency corresponding to the shortest pit or mark, and

a Q value of the low-pass filter is not less than 2.

6. An apparatus according to claim 1, wherein a transfer function H of the equalization unit is given by:

$$H = (1+3.99\times10^{-8}s)/$$
$$(1+1.58\times10^{-8}s+1.41\times10^{-16}s^2+1.24\times10^{-24}s^3)$$

$s = j\omega$ (complex frequency)

7. An apparatus according to claim 5, wherein a ratio of the shortest pit or mark to the pit or mark for which the reproduction signal amplitude saturates is 2 : 8.

8. An apparatus according to claim 1, wherein the gain at the frequency corresponding to the shortest pit or mark is not less than 0.

9. An information processing method for processing a signal read out from a disk on which information is recorded by pits or marks with various lengths, comprising:

divisionally detecting light reflected by the disk as a plurality of photodetection signals;

equalizing waveforms of the plurality of detected photodetection signals by an equalizer having frequency-gain characteristics that obtain a gain of not less than 15 dB at a frequency corresponding to a shortest pit or mark; and

generating a tracking error signal on the basis of a phase difference between the plurality of equalized signals.

10. A method according to claim 9, wherein the equalizer has frequency-gain characteristics that obtain a gain of not more than -3 dB at a frequency three times the frequency corresponding to the shortest pit or mark.

11. A method according to claim 9, wherein the equalizer includes:

a high-pass filter having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency, and a gain increases in a third frequency band between the first and second frequencies, and

a low-pass filter having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency.

12. A method according to claim 10, wherein the

equalizer includes:

a high-pass filter having frequency-gain characteristics in which a gain is constant within a first frequency range not more than a first frequency, a gain is constant within a second frequency range not less than a second frequency which is more than the first frequency, and a gain increases in a third frequency band between the first and second frequencies, and

a low-pass filter having frequency-gain characteristics in which a gain attenuates within a fourth frequency band not less than a third frequency.

13. A method according to claim 12, wherein the first frequency range is a frequency range 0.5 to 1.5 times a frequency corresponding to a pit or mark with which a reproduction signal amplitude saturates,

the second frequency range is a frequency range 0.5 to 1.5 times the frequency corresponding to the shortest pit or mark,

the third frequency matches the frequency corresponding to the shortest pit or mark, and

a Q value of the low-pass filter is not less than 2.

14. A method according to claim 9, wherein a transfer function H of the equalizer is given by:

$$H = (1+3.99\times10^{-8}s)/$$

$$(1+1.58\times10^{-8}s+1.41\times10^{-16}s^2+1.24\times10^{-24}s^3)$$

$s = j\omega$ (complex frequency)

15. A method according to claim 13, wherein a ratio of the shortest pit or mark to the pit or mark for which the reproduction signal amplitude saturates is 2 : 8.

16. A method according to claim 9, wherein the gain at the frequency corresponding to the shortest pit or mark is not less than 0.